



**Educational expansion without equalization: a reappraisal
of the 'Effectively Maintained Inequality' hypothesis in
children's choice of the upper secondary track.**

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1. Introduction

Trends over time in Inequalities of Educational Outcomes (IEO) have been widely scrutinized in industrialized countries. The general consensus on the persistency of IEO throughout the 20th century, which prevailed during the '90s (Shavit and Blossfeld 1993), has gradually left space to competing arguments claiming a weakening of the association between social origins and educational attainment (Breen *et al.* 2009). Research concerning trends in IEO in Italy followed the same pattern, shifting from empirical analyses which found persistent inequalities to more recent studies claiming that a process of equalization has taken place (see Triventi 2014 for a review).

Most of the studies concerning Italy showed that IEO have declined during the period of the Italian "economic miracle" (i.e., for individuals born in the '40s and the '50s), mostly (but not exclusively) among agricultural classes and in the transition to lower secondary school. This pattern of "selective equalization" (Barone and Guetto 2016), recently confirmed as a feature common to many industrialized countries (Ganzeboom and Treiman 2014), brought some scholars to question the substantive relevance of the critiques of the persistent inequality thesis (Shavit *et al.* 2007). Such concerns seem particularly cogent in the Italian case. In fact, it has been shown that trends toward declining IEO have flattened out among the youngest cohorts of individuals born in the '60s and the '70s (Barone and Guetto 2016). Nowadays, Italy stands as one of the most economically unequal among the industrialized countries (Nolan *et al.* 2014), as previous results on social fluidity (Breen and Lujckx 2004) and IEO already suggested (Breen *et al.* 2009).

This paper contributes to the literature on trends in IEO by analyzing social inequalities in the choice of the upper secondary track in Italy. The latter is particularly important to understand the (persistently) strong effects of social origins on educational attainment in the Italian setting, given the moderate degree of stratification of its educational system at the upper secondary level, when compared to other Western educational systems (Müller and Shavit 1998; Pfeffer 2008). The questions we aim to answer are the following: how are social inequalities in the choice of the upper secondary track structured by parental education and social class? Did they change among individuals born between 1958 and 1989?

Previous contributions on the topic (Panichella and Triventi 2014; Pisati 2002) focused on long-term trends and found evidence that, in the period of highest expansion of upper secondary schools, i.e. between the '50s and the '70s, horizontal inequalities became larger, consistently with Lucas's (2001) thesis of "Effectively Maintained Inequality" (EMI). Our analyses, which make use of a unique dataset obtained by merging five waves of the IARD survey on the condition of Italian youth (1983-2004), focus instead on the youngest cohorts. We document that enrolments at upper secondary schools have become almost universal among individuals born in the second half of the '70s, and have been followed by a huge expansion of the academic track. Although the latter has also involved children belonging to the lowest social strata, our analyses suggest that their relative disadvantage to attend the academic track, compared to the most privileged social groups, has diminished only slightly. In addition, when more subtle differences within the academic track are considered, we find increasing social inequalities in the chances to attend more prestigious curricula. Thus, our analyses provide additional evidence in support of the EMI thesis, also confirming previous findings concerning the French case (Ichou and Vallet 2011).

Finally, following Bukodi and Goldthorpe (2013), we hypothesize that parental education and social class jointly contribute to IEO: social class inequalities in the chances of enrolling at the academic track should be stronger at high levels of parental education, while they should be largely muted among low-educated parents. Empirical analyses confirm our theoretical expectation and we suggest the latter as a possible

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3 mechanism to explain why educational expansion has not produced an overall decline in the association
4 between social origins and educational attainment.
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6 **2. Theoretical background**

7 *2.1 The Italian educational system*

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10 Nowadays education in Italy is compulsory from 6 to 16 years of age and is divided into four main stages:
11 primary, lower and upper secondary school, and tertiary education.¹ Primary and lower secondary school
12 are undifferentiated and the first level characterized by tracking is the upper secondary one. There are
13 three available tracks: the academic, the technical and the vocational. The academic track includes the
14 more demanding classical and scientific lycei (*liceo classico* and *liceo scientifico*) as well as other lycei
15 focused on foreign languages (*liceo linguistico*), arts (*liceo artistico*) and music (*conservatorio*). The technical
16 track (*istituti tecnici*) provides theoretical and vocational education in the economic and technological
17 fields. For the type of education provided, also teaching-training schools (*scuole/istituti magistrali*) can be
18 considered as belonging to this track. Vocational institutes (*istituti professionali*) supply vocational training
19 in areas of the service, industry and craft sectors and the courses offered last from 3 to 5 years.
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24 The *Gentile reform* of 1923 established that only graduates of classical lyceum could enroll at all fields of
25 tertiary education, while graduates of scientific lyceum could not enroll at the humanistic ones (law,
26 philosophy and literature). Classical lyceum was thus considered as the most “prestigious” upper secondary
27 school, which traces back to the traditional Italian orientation toward humanistic subjects. Access to
28 tertiary education was not allowed to the graduates of all other types of upper secondary schools.
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31 After 1969, with the complete liberalization of access to tertiary education, all upper secondary curricula
32 lasting five years end with a final exam known as *Esame di Maturità*. All students passing this exam can
33 enroll at university, independently of the attended track. However, there is a bulk of empirical evidence
34 showing that access to tertiary education in Italy is highly stratified based on the choice of the upper
35 secondary track: while the large majority of pupils who attended the academic track subsequently enroll at
36 university, the chances of doing so decline moving to technical and especially to the vocational tracks
37 (Azzolini and Vergolini 2014).
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39 *2.2 Theories on trends in IEO concerning the choice of the upper secondary track*

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42 Enrolments at upper secondary schools have increased to become almost universal among the Italian birth
43 cohorts under scrutiny (1958-1989). For this reason, our focus throughout the paper will be on the relative
44 chances of enrolling in the different tracks. There are three possible theoretical expectations on the
45 relation between educational expansion and trends in IEO concerning the choice of the upper secondary
46 track.
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50 According to a first hypothesis, educational expansion, by making less discriminatory the selection process,
51 could be related to an equalization of the chances of enrolling at the academic track for children of
52 different social origins. However, existing empirical evidence does not support this claim. For instance, IEO
53 in Italy declined before the educational expansion fostered by the school reforms of the '60s, likely due to
54 the industrialization process (Ballarino and Schadee 2008; Barone and Guetto 2016). In fact, expansion per
55 se, when explicitly operationalized, came out to even increase the association between social origins and
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58 ¹ For a more detailed description of the Italian educational system see the Eurydice page:
59 <https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Italy:Overview>
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3 children's educational attainment (Bar-Haim and Shavit 2013). Therefore, there are no reasons to expect
4 the expansion of the enrolments at upper secondary schools to be related to a decline in the relative
5 disadvantage of children of lower social strata to attend the academic track.
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8 Apart from educational expansion, social inequalities in the access to the academic track would decline
9 following a reduction in primary and secondary effects of social origins on educational attainment (Boudon
10 1974; Jackson 2013). Grades at the end of lower secondary education are a strong predictor of track choice
11 (Contini and Scagni 2013). However, the (limited) available empirical evidence suggests stable differentials
12 by parental education and class.² Children's choice of the academic track would become less stratified also
13 if economic differentials between classes reduced, but income inequalities in Italy showed no clear
14 tendency between the second half of the '70s and the first half of the 2000s (Atkinson and Brandolini
15 2004).
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18 According to EMI, when a large part of pupils have access to upper secondary schools, higher classes will
19 maintain their relative advantages by choosing the most remunerative tracks (Lucas 2001). Pisati (2002)
20 and Panichella and Triventi (2014) found an increase of social class inequalities in reaching the academic
21 track among Italian children born before the '70s, consistently with the EMI hypothesis since the large part
22 of the expansion at the upper secondary level occurred in the first decades after WWII and the higher
23 classes are the first to exploit the new opportunities (Bar-Haim and Shavit 2013). However, it can be argued
24 that class differences remain stable, or even start to decline, when the expansion at the upper secondary
25 level approximates the saturation level (Arum *et al.* 2007). Therefore, we hypothesize that, despite the
26 ongoing expansion of upper secondary schooling (Figure 1), IEO in the choice of the upper secondary track
27 have remained fairly stable among youngest Italian cohorts. Our first hypothesis can be therefore
28 summarized as follows:
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33 H1: among the selected cohorts, "*persistent inequality*" is the best approximation of trends in IEO in the
34 choice of the upper secondary track in Italy.
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37 Our descriptive findings also suggest a substantial increase of the enrolments at scientific and other lycei
38 starting from the early '70s, at the expense of the vocational and especially the technical track. While we do
39 find that children of the Petite bourgeoisie and the Working class have gradually become the most likely to
40 enroll at vocational and technical tracks, trends of increasing enrolments in the above-mentioned curricula
41 of the academic track involved all social classes.³
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43 [about here Figure 1]
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46 The recent expansion of the academic track allows for a test of the EMI hypothesis in terms of more subtle
47 aspects of horizontal inequalities. In fact, most of the expansion did not concern the most prestigious
48 classical lyceum, but rather other lycei and especially the scientific one. Following the EMI hypothesis, the
49 overall expansion of the academic track could have led to an increase in social inequalities in accessing
50 more prestigious curricula.⁴ Thus, our second hypothesis can be summarized as follows:
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53 ² Elaborations based on the "Survey on education and work careers of upper secondary graduates" (1995-2007) are
54 available upon request.

55 ³ Previous studies only partially included most recent cohorts and could not analyze them in detail due to their
56 youngest cohort being too broad, including individuals born between 1969 and 1983 (Panichella and Triventi 2014)
57 and between 1968 and 1979 (Pisati 2002).

58 ⁴ The competitive value of classical lyceum *vis-à-vis* scientific lyceum cannot be justified by higher expected returns,
59 but rather by the higher social status traditionally attributed to this type of school. In fact, humanistic tertiary fields,
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3 H2: *the expansion of the academic track has increased the social selectivity into the classical lyceum vis-à-*
4 *vis scientific lyceum and into the latter vis-à-vis other lycei.*

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7 2.3 *Disentangling the effects of parental class and parental education*

8 Recent contributions recalled the importance of disentangling the effects of different dimensions of “social
9 origins”, since trends in IEO might concern differently parental education, status and social class (Bukodi
10 and Goldthorpe 2013; Marzadro and Schizzerotto 2014). While it is well-known, for the Italian case, that
11 parental education is a stronger predictor of educational attainment than social class (Ballarino and
12 Schadee 2010; Triventi *et al.* 2016), we predict class inequalities in reaching the academic vs. technical or
13 vocational tracks to be stronger at higher levels of parental education. More precisely, our third hypothesis
14 can be summarized as follows:
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18 H3: *the association between parental social class and children’s enrolment at the academic track, with*
19 *respect to technical and vocational ones, is stronger at higher levels of parental education.*

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21 The basic intuition behind this hypothesis is that parents who have reached a high class position without a
22 significant educational investment, as well as parents whose educational investment did not pay off in
23 terms of class returns, do not believe in the value of investing in their children’s academic education.
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26 We frame children’s choices of the upper secondary track as stemming from the joint decision of both
27 parents’ in their children’s education. Based on rational-action accounts of parental choices, parents would
28 choose for their children the type of education perceived as necessary to allow them to reach at least the
29 same social class they belong to (Breen and Goldthorpe 1997). If this is the case, highly educated parents
30 who succeeded in reaching at least the intermediate classes would likely put a lot of emphasis on their
31 children’s educational attainment. This should be the more true in Italy among civil servants and registered
32 professionals, given the high levels of credentialism in the Italian labor market (Barone 2013). Investing in
33 their children’s academic education presents particularly high expected returns for parents belonging to
34 the professional orders, since, in Italy, the access to the liberal professions follows strict “familistic”
35 recruitment channels (Pellizzari and Orsini 2012). On the contrary, highly educated parents who failed to
36 reach at least the intermediate classes could think that investments in academic education are too risky
37 and eventually not worth.⁵
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41 The same risk-aversion mechanism would suggest that low-educated parents do not have strong incentives
42 in investing in their children’s academic education if they belong to the working class. But also if they
43 managed to reach the entrepreneurial or small proprietors classes they could think that academic
44 education is not really necessary: it is well-known that urban – and especially agricultural – self-employed
45 classes tend to reproduce themselves thanks to direct inheritance of capital rather than educational
46 credentials (Erikson and Goldthorpe 1992). The low incentives of low-educated parents, belonging to the
47 self-employed classes, to invest in their children’s academic education are exacerbated in the Italian labor
48 market. In Italy, self-employed, largely operating in low human capital intensity sectors, can earn much
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54 which constitute a more common choice for graduates of classical lyceum, provide substantially lower wages
55 (Ballarino and Bratti 2009; Vergolini and Vlach 2016).

56 ⁵ As suggested by one anonymous referee, our argument here recalls Breen’s one (1999) about the importance of
57 effort for educational success based on Bayesian learning: if the parents have learned that effort (in our case,
58 education) is not very relevant for educational (in our case, occupational) success, they will transmit this belief to their
59 children, with consequences for their effort (in our case, educational investment).
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3 more and are better able to avoid poverty than skilled manual or routine non-manual workers (Brandolini
4 2005).

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6 To sum up, at higher levels of education, different incentives' structures should produce an additional social
7 fracture, in the chances to enroll at the academic track, between children of the Bourgeoisie and the White
8 collars on the one hand and children of the other classes on the other.
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10 3. Data and methods

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12 The data used in this paper comes from the IARD surveys on the condition of the youth carried out on
13 representative samples of young Italians in 1983, 1987, 1992, 1996, 2000, and 2004 (Buzzi *et al.* 2007).⁶
14 IARD definition of "youth" changed over time: the age-range is 15-24 in the first two waves, 15-29 in the
15 third and fourth ones, 15-34 in the last two waves. To carry out our analyses we pooled together all the
16 waves except from the 1987 one for lacking information on crucial variables, while in the 1992 wave only
17 information for those who were attending upper secondary school at the moment of the interview is
18 available. By doing this, we rely on repeated observations for the selected cohorts, apart from the oldest
19 one only covered by the 1983 wave (Table 1).
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23 [about here Table 1]
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25 The dependent variable is the attended upper secondary track. The latter corresponds to a) the track
26 respondents are enrolled at, among those who are studying at upper secondary school at the moment of
27 the interview, to b) the last attended track for those who dropped out from upper secondary school and to
28 c) the kind of diploma attained for those who completed upper secondary school.⁷ We first coded the
29 original information in seven categories: not enrolled; vocational track (less than 5 years); vocational track;
30 technical track; other lycei (*linguistico, artistico, conservatorio, psico-socio-pedagogico* and *scienze umane*);
31 scientific lyceum; and classical lyceum.⁸ Then, to test our hypotheses we relied on reduced versions of the
32 variable. The first one distinguishes individuals not enrolled to upper secondary schools from those
33 enrolled to the vocational, technical or academic track. To test our second hypothesis we pooled together
34 all individuals not enrolled or enrolled to a non-academic track, while keeping separated the different
35 curricula within the academic track.
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39 The main independent variables are parental social class and parental education. For parental social class,
40 we rely on a variable which follows the EGP scheme (Erikson and Goldthorpe 1992). Our measure of
41 parental class has not been obtained by means of objective information on employment status and
42 standard ISCO classifications of occupations. Rather, children were asked to select both parents'
43 occupational positions among a set of pre-coded ones that we aggregated in 5 categories (applying the
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49 ⁶ IARD is a private research center that has conducted research on Italian youth for 40 years. IARD data has been
50 already used in international researches on educational inequality (Contini and Scagni 2013) and family behaviors in
51 Italy (Guetto *et al.* 2016). More information on the quality of our data and measures is provided in the appendix
52 (Tables A1 and A2 and Figure A1).

53 ⁷ Information on those who dropped out from upper secondary school is not available for the first two waves.
54 However, robustness checks, shown in Figures A2 and A3 in the Appendix, confirm that our results are not only highly
55 consistent across waves, but do not change at all when excluding students (about 25% of the analytical sample).

56 ⁸ As mentioned, teaching-training schools have been included in the technical track. However, since the second half of
57 the 90s, the latter schools have been replaced by "*liceo psico-socio-pedagogico*" and "*liceo delle scienze umane*",
58 which have been included among other lycei. That is because teachers of primary and pre-primary schools are now
59 required to hold a specific tertiary degree, for which students are prepared in the above-mentioned lycei.
60

dominance criterion) defined as follows⁹: Bourgeoisie (classes I and II); White collars (classes IIIa and IIIb); Petite bourgeoisie (classes IVa and IVb); Working class (classes V; VI and VIIa); Farmers (classes IVc and VIIb); an additional dummy for unemployed and inactive parents.¹⁰ Results presented in the appendix (Table A1) comfort us about the accuracy of our measures of social origins, confirming that social class can be reliably and validly measured by either crude or detailed occupational codes (Ganzeboom 2005).

Both parents' educational attainment has been recoded in 5 categories: without any title, primary, lower secondary, upper secondary and tertiary education. Given that preliminary analyses (Table A3 in the appendix) showed that both variables contribute to children's track choice, we will employ a principal component factor score drawn from the two variables.

The third independent variable is the birth cohort, coded in five categories of similar sample sizes and number of covered years: 1958-1964; 1965-1969; 1970-1974; 1975-1979 and 1980-1989.

Additional control variables are sex and geographic area of residence (North-West; North-East; Centre; South and Islands). Considering that the attended track is a discrete categorical variable, we modelled the odds, say η_{ij} , that student i falls in the track j ($j=1, \dots, J-1$) as opposed to a baseline track ($j=J$) as follows:

$$(1) \quad \eta_{ij} = \frac{\pi_{ij}}{\pi_{iJ}} = \alpha_j + \beta_1 Peduc_i + \beta_2 Class_i + \beta_3 Cohort_i + \beta_4 Sex_i + \beta_5 Area_i + \beta_6 Sex_i \cdot Cohort_i$$

Where *Peduc* represents a factor score for parental education; *Class* is a vector of dummy variables measuring parental social class; *Cohort* is a vector of dummies for birth cohorts; *Sex* and *Area* are a set of dummies for respondents' sex and geographical area of residence. Finally, the interaction between sex and birth cohort is included in order to take into account the expansion of female schooling. Equation (1) is implemented twice, for both versions of the dependent variable, and represents the baseline model (Models 1a and 1b in Table 2). Any extension will be evaluated using this model as a reference.¹¹ In order to test our hypotheses, we estimate three additional models, adding to the baseline one an interaction between parental education and birth cohort (Models 2a and 2b); parental class and birth cohort (Models 3a and 3b); and between parental education and class (Model 4a). We rely on Log-likelihood ratio (Llr) tests to assess whether the baseline model's goodness-of-fit improves with the different specifications.

4. Results

4.1 Trends in social inequalities concerning the attended upper secondary track

In Table 2 we compare fit statistics of Models 1a and 1b, the baseline models, which assume persistent inequality, with Models 2a, 2b, 3a and 3b which assume changes over cohorts, either in direction of increasing or decreasing inequalities.

[about here Table 2]

⁹ For reasons of harmonization across the different waves we could not separate classes IIIa and IIIb.

¹⁰ In this last category are included cases with non-working parents for which it has not been possible to recover the last occupation. However, they constitute altogether less than 5% of the final sample and their results are never commented.

¹¹ We refer to the appendix (Table A3) for a brief discussion showing that the chosen operationalization of parental education and class, relative to the inclusion of both parents' characteristics, represents an optimal solution in terms of parsimony and predictive power of the model.

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3 We start commenting the results concerning our first specification, which allows to test hypothesis H1. As
4 both AIC and BIC statistics indicate, the lost in parsimony of models with interactions between social origins
5 and birth cohort is not counterbalanced by a substantial decrease of the Log-likelihood (Models 2a and 3a).
6 That is, persistent inequality represents an accurate and parsimonious description of trends in the relative
7 chances of children of different social origins to enroll at the different tracks. However, the Llr-test reports
8 marginally significant changes over cohorts as far as the effects of parental class are concerned (Model 3a).
9 The discrepancy between AIC and BIC statistics on the one hand and the Llr-test on the other suggests that
10 marginal changes in IEO concerning the attended upper secondary track have occurred within a picture of
11 substantial inertia of social inequalities. Figure 2 allows to analyze more in detail the direction of these
12 changes.
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16 [about here Figure 2]
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18 Each plot of Figure 2 includes log-odds ratios describing how the relative chances of reaching the academic
19 (top panel) or the technical (bottom panel) vs. vocational track have changed for children of different social
20 classes, compared to children of the White collars. Due to the small number of cases among youngest
21 cohorts, results concerning Farmers are not reported. Results indicate that the White collars have reduced
22 their distance from the Bourgeoisie in the relative chances of reaching both technical and academic tracks.
23 White collars have also gained a slight advantage over the Petite-bourgeoisie, which becomes statistically
24 significant only in the last cohort. On the contrary, the disadvantage of Working class children compared to
25 their White collars counterparts did not change much throughout the observed period, especially as far as
26 enrolment in the academic track is concerned. All in all, results suggest that the marginally significant
27 change in the effects of parental class found in Model 3a in Table 2 is mostly driven by the improved
28 chances of reaching technical and academic tracks among children of the White collars, and partly so also
29 among children of the Working class.¹²
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34 We now shift to the results concerning our second specification, where we distinguish between the
35 different curricula within the academic track. Even in this case, both AIC and BIC statistics suggest that no
36 significant changes over cohorts have occurred (Models 2b and 3b). However, the Llr-test reports
37 significant changes over cohorts as far as the effects of parental education are concerned (Model 2b). As
38 Figure 3 shows, a unitary increase in the factor score for parental education produced a non-significant
39 increase in the odds of enrolling at the scientific lyceum vs. other lycei in the first three cohorts.
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42 [about here Figure 3]
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44 However, the log-odds ratio turns significantly different from zero in the last two cohorts, signaling
45 increased selectivity into the scientific lyceum, confirming our hypothesis H2. Higher parental education,
46 net of parental class, has always significantly discriminated between enrolments into a classical vs. other
47 lycei. In the first two cohorts, the selectivity of classical lyceum was only marginally significantly higher (if at
48 all) with respect to scientific lyceum. However, in the youngest cohorts a clear hierarchy across the
49 different curricula is found. It is interesting to notice that the net effect of parental class, and its change
50 across cohorts, focuses on the choice of the academic vs. non-academic tracks, consistently with social class
51 grasping the direct and indirect costs of tertiary education. On the contrary, the direct effect of parental
52 education exerts an additional effect, increasing across cohorts, discriminating between the different
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58 ¹² Robustness checks using a more parsimonious model (ordered logistic regression) produced an almost identical
59 pattern of changes across cohorts (see Figures A4 and A5 in the appendix).
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3 curricula within the academic track, possibly indicating the higher “prestige” that well-educated parents
4 tend to attribute to the classical lyceum.
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6 *4.2 Class inequalities at different levels of parental education*

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8 Do class inequalities in children’s choices of the upper secondary track change at different levels of parental
9 education? The comparison of fit statistics of Models 4a and 1a in Table 2 shows that the BIC statistics of
10 the model with the interaction between the two measures of social origins is still bigger than that of the
11 baseline model. However, the AIC statistics, which puts less emphasis on model’s parsimony, is now smaller
12 than that of the baseline model. Moreover, the Llr test is highly significant.
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15 Our hypothesis H3 claims that class inequalities should be stronger at higher levels of parental education. In
16 this respect, each plot of Figure 4 includes log-odds ratios describing how the relative chances of children of
17 different social classes in reaching the technical (left panel) or the academic (right panel) track, relative to
18 the vocational one, change with a unitary increase of the factor score measuring parental education.
19 Results confirm our expectations that the interaction is particularly salient for the choice of the academic
20 track, creating an additional fracture between the Bourgeoisie and the White collars on the one hand and
21 all other classes on the other.
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25 [about here Figure 4]
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27 It is interesting to evaluate the predicted probabilities of reaching the academic track for specific
28 combinations of parental education and class, thus providing a picture of how the absolute chances of
29 reaching the academic track are defined in terms of both variables. Predicted probabilities, based on the
30 same model as above, are presented in Figure 5, for combinations of parental class and tertiles of the factor
31 score for parental education (see note to Figure 5 for details).
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34 [about here Figure 5]
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36 At lower levels of parental education very small class inequalities are found, so that the absolute chances of
37 enrolling in the academic track are lower than 15% for children of all classes. At medium levels of
38 education, a monotonic increase in the probabilities can be observed moving from Working and agricultural
39 classes to intermediate classes and from the latter to the Bourgeoisie. At higher levels of education, class
40 differences become huge: while children of the Bourgeoisie record an about 70% probability of enrolment,
41 the same figure barely reaches 30% for their Working class counterparts.
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44 These results confirm that high parental education is fundamental for children chances of enrolling at the
45 academic track. But the extent to which high parental endowments of educational resources translate into
46 actual children’s enrolments strongly depends on parental social class, i.e. the different capabilities of
47 coping with the direct and indirect costs of tertiary education, as well as different incentives’ structures, as
48 we hypothesized. In fact, an interpretation of the results based on economic resources alone would not
49 explain why, at lower levels of parental education, children of the Bourgeoisie (i.e., entrepreneurs) have
50 almost the same probability to enroll at the academic track of children of the Working class (i.e., unskilled
51 manual workers).
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54 **5. Conclusions**

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57 Previous studies showed increasing horizontal inequalities among those cohorts more directly involved in
58 the expansion of upper secondary schooling in Italy (Pisati 2002; Panichella and Triventi 2014), consistently
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3 with the EMI hypothesis. Our data, focusing on more recent cohorts, shows that the last waves of
4 expansion of the enrolments at upper secondary schools, which have become almost universal, have been
5 followed by an expansion of the academic track. The latter has involved also the most disadvantaged social
6 classes and a slight process of equalization has concerned children of the White collars, and partly so also
7 children of the Working class, which have gained a significant advantage, with respect to the Bourgeoisie
8 and the Petite bourgeoisie, in enrolling at technical and academic tracks. However, the overall picture
9 concerning recent trends over time is that of a substantial inertia in horizontal inequalities, consistently
10 with our first hypothesis. When distinguishing between the different curricula within the academic track,
11 we found evidence supporting the EMI hypothesis also among recent cohorts: the expansion of the
12 academic track has gone hand-in-hand with increasing selectivity into the different curricula, in terms of
13 parental education, thus confirming our second hypothesis. Among the youngest cohorts, a clear hierarchy
14 between the most prestigious classical lyceum, followed by the scientific and other lycei, has been
15 identified. Results suggest a two-stage process of educational expansion concerning upper secondary
16 schools in Italy: a growth of overall enrolments followed by an expansion of the academic track. Since each
17 stage has been found to be associated with increasing horizontal inequalities, we might conclude that,
18 when it comes to educational expansion, "all roads lead to inequality" (Ichou and Vallet 2011). Policies
19 aimed at rising overall schooling may thus not be able to reduce relative IEO: the former should be
20 specifically aimed at increasing educational attainment of children with disadvantaged socioeconomic
21 backgrounds (Barone 2012).
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27 Finally, our results also point to the existence of intertwined effects of parental education and class. We
28 hypothesized that parental social class matters more at higher levels of parental education: parents who
29 have reached a high class position without a significant educational investment, as well as parents whose
30 educational investment did not pay off in terms of class returns, have very low incentives in investing in
31 their children's academic education. In fact, our results show that social class inequalities in the relative and
32 absolute chances of enrolling in the academic track are muted at low levels of parental education.
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35 Although our data does not allow for a formal testing, given the limited number of cases across all possible
36 combinations of birth cohort, parental education and social class, the interaction between the latter
37 variables suggests a possible compositional mechanism underlying the persistency of IEO in spite of
38 educational expansion. In fact, when education expands, also the share of high-educated parents increases
39 across cohorts. Since the latter are particularly inclined to invest in their children's academic education if
40 they belong to the higher classes, this would generate higher class inequalities, potentially
41 counterbalancing equalization trends driven by a more open selection process into the educational system.
42 The increasing prevalence over time of educational homogamy at higher levels of education (Bernardi
43 2002), a feature common to almost all Western societies (Schwartz and Mare 2005), could have further
44 reinforced this process. It is therefore interesting to see whether a similar pattern of results found for the
45 Italian case would emerge analyzing other countries.
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Figures

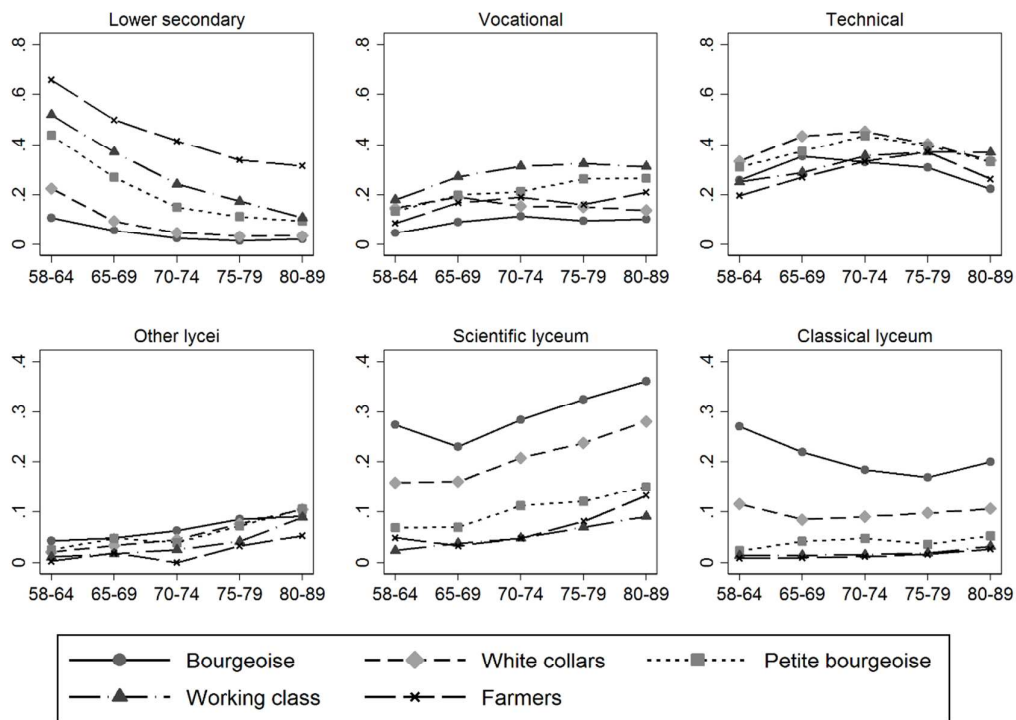


Figure 1. Proportion of students enrolled in the different tracks of upper secondary school according to parental social class.

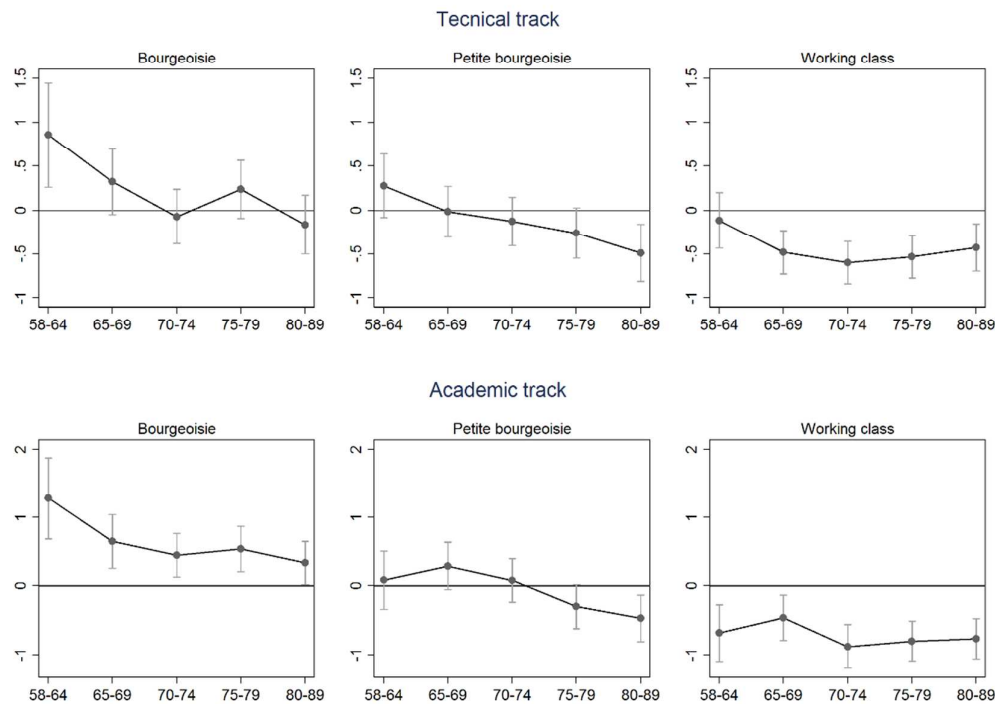


Figure 2. Log-odds ratios and corresponding standard errors at 90% deriving from a multinomial logistic regression to analyze the effects of parental social class on the choice of the academic and technical tracks, with respect to the vocational one, over birth cohorts.

Note: the reference category for parental social class is "White collars". The parameters represent the main effects of parental social class plus the interaction coefficients between parental social class and birth cohort.

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Parental education

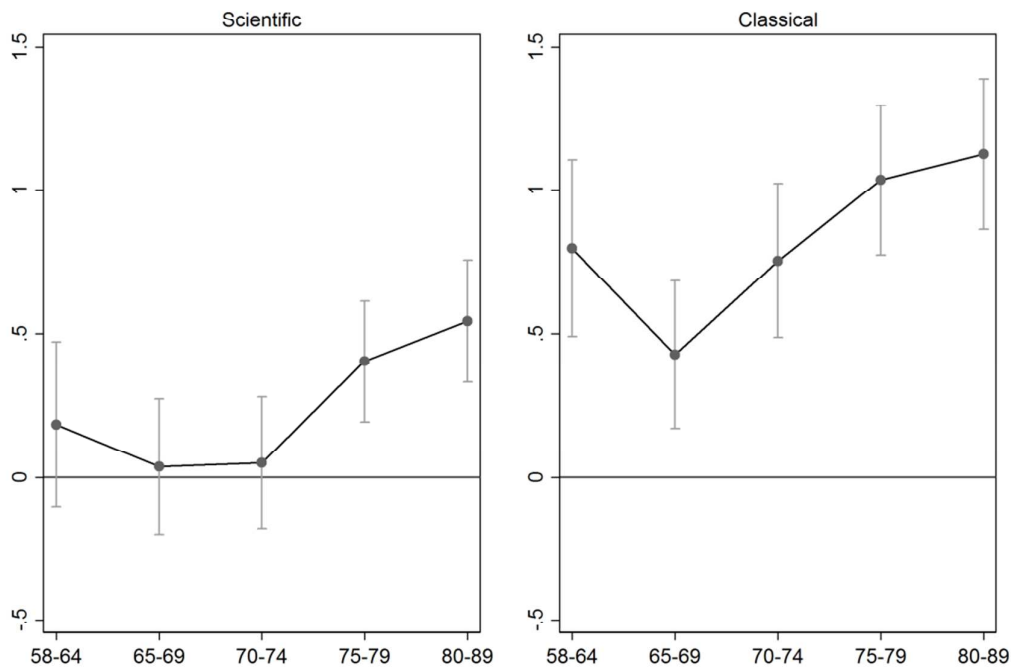


Figure 3 Log-odds ratios and corresponding standard errors at 90% deriving from a multinomial logistic regression to analyze the effects of parental education on the choice of scientific and classical lycei, with respect to other lycei, over birth cohorts.

Note: the parameters represent the main effects of parental education plus the interaction coefficients between parental education and birth cohort.

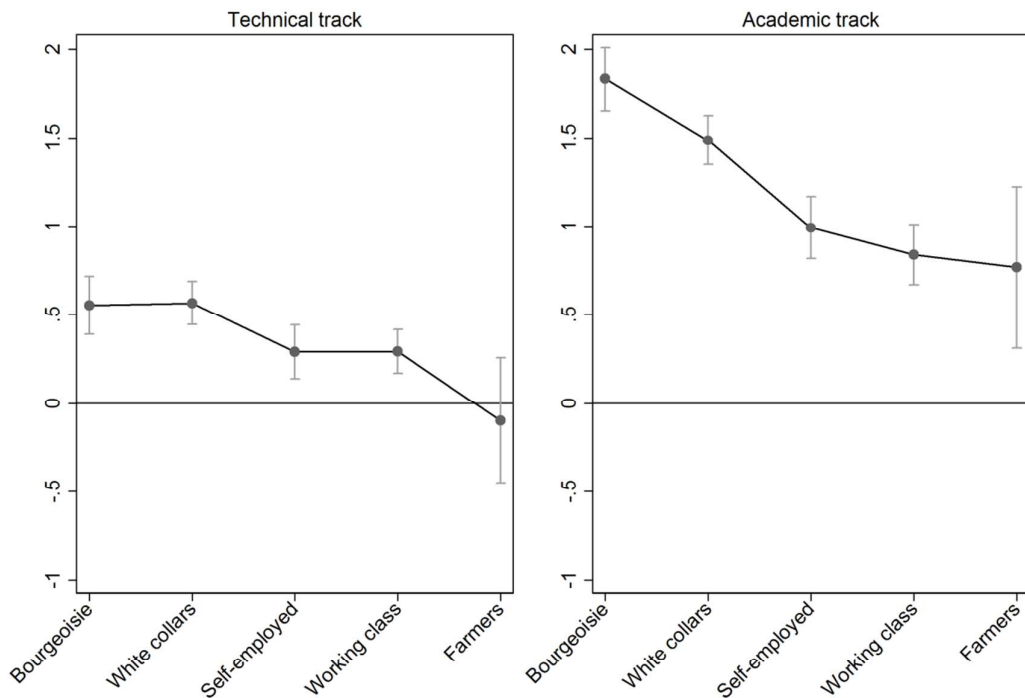


Figure 4. Log-odds ratios and corresponding standard errors at 90% deriving from a multinomial logistic regression to analyze the interaction between parental social class and parental education on the choice of the academic and technical track, with respect to the vocational one.

Note: the parameters represent the main effects of parental education plus the interaction coefficients between parental education and parental social class.

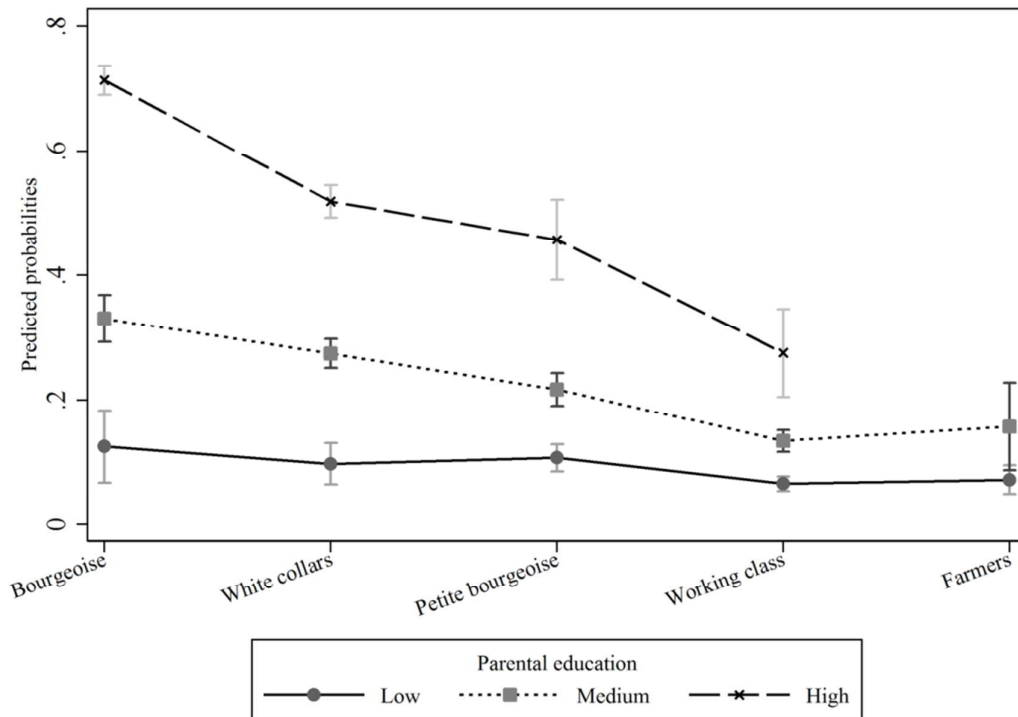


Figure 5. Predicted probabilities of enrolment at the academic track deriving from a multinomial logistic regression with interaction between parental social class and parental education.

Note: the factor score for parental education has been categorized in tertiles. The “Low” category mainly includes parents with at most a primary degree; the “Medium” category mainly includes parents with lower and upper secondary degrees; the “High” category mainly includes parents with at least an upper secondary degree. The predicted probability for Farmers with high level of education is not reported due to the low number of cases (8) belonging to this category.

Tables

Table 1

Sample size according to cohort and wave.

Wave \ Cohort	IARD83	IARD92	IARD96	IARD00	IARD04	Total
1958-64	2,585	2	0	0	0	2,589
1965-69	1,295	10	487	652	142	2,586
1970-74	0	239	833	809	602	2,483
1975-79	0	267	730	795	622	2,414
1980-89	0	0	155	541	1,430	2,126
Total	3,880	518	2,205	2,797	2,796	12,196

Table 2

Goodness-of-fit measures for nested models.

Model	N	Log-likelihood	d.f.	AIC	BIC	Llr test (p-value)
<i>Field (not enrolled, vocational, technical, academic)</i>						
1a. Baseline	12,196	-13,430.85	57	26,975.70	27,398.00	---
2a. Interaction between cohort and parental education	12,196	-13,423.58	69	26,985.17	27,496.38	14.53 (0.268)
3a. Interaction between cohort and parental social class	12,196	-13,392.86	117	27,019.72	27,886.55	75.98 (0.080)
4a. Interaction between parental social class and education	12,196	-13,388.93	72	26,921.86	27,455.30	83.83 (0.000)
<i>Field (not enrolled/not academic; other, scientific or classical lyceum)</i>						
1b. Baseline	12,196	-8,270.40	57	16,654.80	17,077.10	---
2b. Interaction between cohort and parental education	12,196	-8,259.48	69	16,656.96	17,168.17	21.84 (0.039)
3b. Interaction between cohort and parental social class	12,196	-8,248.11	117	16,730.22	17,597.06	44.57 (0.932)

Legend: AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; d.f. = degrees of freedom; Llr-test = Log-likelihood ratio test.

Note: the Log-likelihood for the null model is equal to -16,541.17 and -10,446.52 in the first and second specification respectively. The Llr-test compares the baseline model with models with the interactions.

Appendix

- Measurement of father's class and parental education: a comparison between IARD and SEWUG data

In Table A1 we compare the marginal distribution of our class variable with an equivalent one deriving from the "Survey on Education and Work careers of Upper secondary Graduates" (SEWUG, 1995-2007), carried out by the Italian Statistical Office. Father's social class in SEWUG data is reconstructed based on three variables: 1-digit ISCO, detailed employment status (distinguishing self-employed, entrepreneurs and professionals and employees with and without supervisory tasks) and sector. We refer to father's social class since in the SEWUG data only information concerning fathers is available.

As it is possible to see, the two surveys, although reconstructing father's social class based on different procedures, reproduce a very similar picture concerning the broad contours of the Italian class structure. The same holds true as far as both parents' educational attainment.

Table A1

Distribution of parental education and father's social class in IARD and SEWUG data.

	IARD	SEWUG
	1975-1987 birth cohorts	Approximate birth cohorts: 1975-1987
Bourgeoisie (classes I-II)	22.1	21.5
White collars (classes IIIa-IIIb)	26.9	29.5
Petite bourgeoisie (classes IVa-IVb)	15.6	15.1
Working class (classes V-VI-VIIa)	32.8	30.2
Farmers (IVc-VIIb)	2.6	3.8
<i>Sample size</i>	4,466	111,501
<i>Father's education</i>		
Primary	20.2	15.2
Lower secondary	32.4	39.0
Upper secondary	34.5	34.9
Tertiary	12.9	10.9
<i>Sample size</i>	4,421	112,833
<i>Mother's education</i>		
Primary	23.9	17.1
Lower secondary	32.8	39.1
Upper secondary	34.0	34.4
Tertiary	9.3	9.4
<i>Sample size</i>	4,461	113,398

Note: SEWUG data pool all surveys carried out in 1995, 1998, 2001, 2004 and 2007.

- Consistency between IARD surveys

In Figure A1 we show trends over birth cohorts concerning attended tracks, separately for the different waves. The 1992 survey has been excluded from the graph given its very small sample size. It clearly emerges that the different waves provide common cohort trends, this suggesting a high level of consistency between their sampling designs.

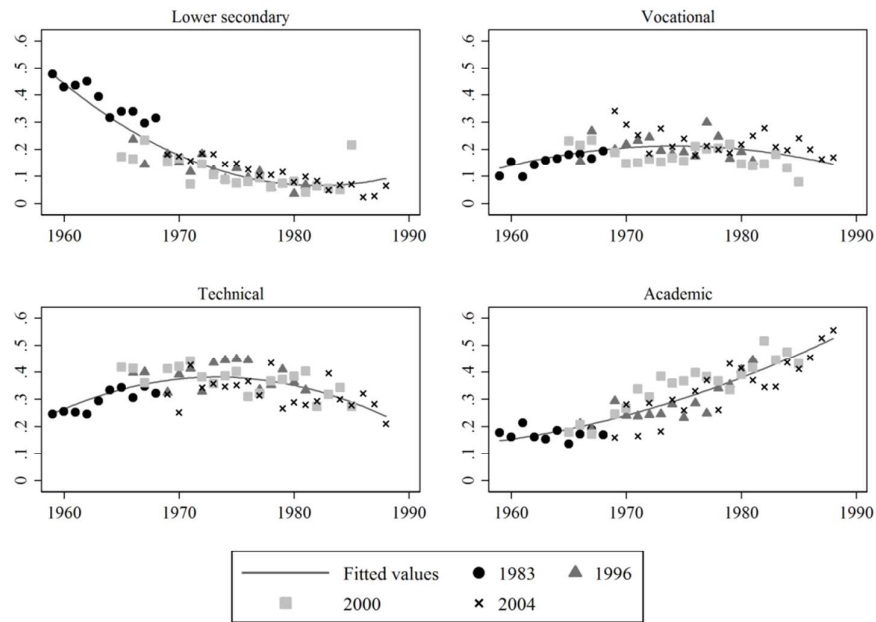


Fig. A1. Proportion of students enrolled in the different tracks of upper secondary school.

- Measurement of enrollments at the different tracks of the upper secondary school: a comparison between IARD, SEWUG and MIUR data

In Table A2 we show the distribution of track choices in IARD, SEWUG and the Italian Ministry of Education (MIUR) data, in a comparable time span. MIUR data refers to all students enrolled at all grades of upper secondary school in the academic year 2004/2005. As it is possible to see, there is a large degree of overlap between the different data sources, with the exception of higher percentages of students in the technical and academic tracks in the SEWUG data: this is due to the fact that SEWUG data only include graduates (thus excluding drop-outs) who passed the *Esame di Maturità* (thus excluding holders of vocational degrees of 2/3 years).

Table A2

Distribution of track choice in IARD, SEWUG and Italian Ministry of Education (MIUR) data.

	IARD	SEWUG (1995-2007)	MIUR (2004)
	1975-1987 birth cohorts	Approximate birth cohorts: 1975-1987	Approximate birth cohorts: 1984-1990
Academic	40.2	43.2	40.8
Technical	37.9	41.0	36.0
Vocational	21.9	15.8	23.2
<i>Sample size</i>	4,242	114,976	2,655,732

- The operationalization of parental education and class

In Table A3 we presents the baseline model (Model 1a in Table 2 in the main text) with the separate inclusion of both parents' characteristics. As mentioned in the paper, results show that both parents' education is related to children's track choices, with only slightly stronger effects on the side of the father. Adopting the dominance criterion, instead of considering the total amount of family educational resources (as we did in our work), would not represent an optimal choice.

In the case of social class the role of fathers stands out more clearly: mother's social class is not related to children's chances of not enrolling at upper secondary school, relative to enrolling at the Vocational track. Children of mothers belonging to the working or agricultural classes have lower chances to enroll at either the Technical or Academic track, relative to the Vocational one, but do not show significantly different chances of enrolling at either of the former two. On the contrary, children's relative chances of enrolling at upper secondary school and choosing more demanding tracks increase monotonically along the father's class ranking. Since social class, net of education, should grasp the effects of economic resources, it is not surprising that fathers matter more in the male breadwinner Italian society. Adopting the dominance criterion, as we did in the main analyses of the paper, represents an optimal choice since in the large majority of cases parental social class corresponds to father's social class. Moreover, by doing so we are able to recover 154 cases due to missing information.

As a synthetic way to show how our preferred, more parsimonious operationalization of parental education and social class fares, compared to the one presented in Table A3, the Pseudo-R² of Model 1a in Table 2 (run on the same estimation sample) is 18.8, very similar to that found in Table A3 (19.3).

Table A3

Multinomial logistic regression on track choice.

	Not enrolled	Technical	Academic
<i>Father's social class</i>			
White collars	0.033 (0.174)	-0.040 (0.105)	-0.362*** (0.108)
Petite bourgeoisie	0.330* (0.171)	-0.238** (0.113)	-0.470*** (0.121)
Working class	0.336** (0.161)	-0.397*** (0.104)	-0.982*** (0.113)
Farmers	0.878*** (0.204)	0.089 (0.169)	-0.147 (0.205)
Not employed	0.272 (0.205)	-0.325* (0.168)	-0.806*** (0.205)
<i>Mother's social class</i>			
White collars	-0.516 (0.469)	-0.367 (0.254)	-0.235 (0.253)
Petite bourgeoisie	-0.128 (0.465)	-0.206 (0.265)	-0.268 (0.270)
Working class	-0.395 (0.458)	-0.630** (0.256)	-0.860*** (0.264)
Farmers	-0.380 (0.488)	-0.710** (0.316)	-1.071*** (0.384)
Not employed	-0.172 (0.452)	-0.421* (0.250)	-0.465* (0.251)
<i>Father's education</i>			
Primary	-0.668*** (0.137)	-0.082 (0.154)	0.462* (0.271)
Lower secondary	-1.119*** (0.154)	0.134 (0.162)	0.953*** (0.276)
Upper secondary	-1.564*** (0.201)	0.435** (0.176)	1.676*** (0.284)
Tertiary	-0.752* (0.201)	0.998*** (0.176)	3.133*** (0.284)

1				
2				
3		(0.398)	(0.268)	(0.344)
4	<i>Mother's education</i>			
5	Primary	-0.303**	0.275**	0.488**
6		(0.120)	(0.132)	(0.205)
7	Lower secondary	-0.641***	0.370***	0.794***
8		(0.143)	(0.143)	(0.213)
9	Upper secondary	-0.877***	0.654***	1.482***
10		(0.207)	(0.162)	(0.226)
11	Tertiary	-1.831**	0.563*	2.231***
12		(0.776)	(0.288)	(0.318)
13				
14	<i>Sex</i>			
15	Female	-0.300**	-0.275**	-0.401**
16		(0.129)	(0.135)	(0.163)
17				
18	<i>Birth cohort</i>			
19	1965-1969	-0.933***	-0.297**	-0.889***
20		(0.131)	(0.128)	(0.159)
21	1970-1974	-1.296***	-0.241*	-0.706***
22		(0.146)	(0.131)	(0.155)
23	1975-1979	-1.485***	-0.334**	-0.820***
24		(0.156)	(0.133)	(0.157)
25	1980-1989	-1.649***	-0.603***	-1.031***
26		(0.179)	(0.139)	(0.160)
27				
28	<i>Sex*birth cohort</i>			
29	Female*1965-1969	0.213	0.095	0.752***
30		(0.178)	(0.175)	(0.217)
31	Female*1970-1974	0.071	0.074	0.590***
32		(0.198)	(0.176)	(0.211)
33	Female*1975-1979	-0.080	-0.007	0.855***
34		(0.214)	(0.178)	(0.209)
35	Female*1980-1989	0.230	-0.063	1.257***
36		(0.241)	(0.188)	(0.212)
37				
38	<i>Geographic area</i>			
39	North-East	0.009	-0.047	-0.176*
40		(0.100)	(0.080)	(0.095)
41	Centre	0.017	0.024	0.072
42		(0.103)	(0.082)	(0.094)
43	South and Islands	0.565***	0.273***	0.307***
44		(0.087)	(0.072)	(0.083)
45	Constant	1.885***	1.072***	-0.387
46		(0.487)	(0.309)	(0.384)
47				
48	N	12,042		
49	Pseudo-R ²	0.193		

Note: *** p<0.01, ** p<0.05, * p<0.1.

The reference category for the dependent variable is Vocational, while for the independent variables we consider respectively: Bourgeoisie, Less than primary, Male, 1958-1964, and North-West.

- Robustness checks

In this section we report a set of robustness checks that we have mentioned in the main text (see footnotes 7 and 12).

- *Consistency of results across IARD waves*

For what concerns the consistency of our findings among waves, we present the interaction between parental education and birth cohort separately for the different waves of IARD data (Figure A2). Given the small sample size and the fact that we have an overlap between waves and cohorts only in the last three waves, which include the last four cohorts (see Table 1 in the main text), we estimate an ordered logistic regression, that is more parsimonious than a multinomial model, and we rely on the 7-category track variable.¹ We report in Figure A2 the log-odd ratios concerning the influence of parental education on track attendance across cohorts separately for the last three waves and for all the surveys. Each coefficient refers to the effect of a unitary increase in the factor score measuring parental education. It emerges that: a) trends are absolutely the same (flat) across all waves, thus confirming the results of Table 2 in the paper pointing to no changes across cohorts; b) the point estimates of the effect of parental education are almost identical across the different waves, which is a quite strong evidence supporting the comparability of the waves.

- *Consistency of results across outcomes (enrolments/final diploma)*

In Figure A3 we re-estimate the results presented in Figure 2 of the main text considering only people who are not studying at the moment of the interview. Unfortunately, information on those who dropped out from upper secondary school is not available for the first two waves. In any case, the trend over birth cohorts shown in Figure A3 is almost identical to the one presented in the paper, even after a loss of about 25% of cases. Thus, we think this is an important hint suggesting that our results are insensitive to the specific subpopulation analyzed (enrolled vs. diploma holders).

- *Consistency of results using modelling strategies with different statistical power*

In Figure A4 we show the results emerging from ordered logistic regressions for the effects of parental class on track attendance coded in seven categories. Since our focus throughout the paper has been on the relative chances of enrolling in the different tracks, keeping vocational ones as reference category, we eliminated individuals not enrolled to upper secondary schools in the ordered specification, to better allow for a comparison with the results of the multinomial logistic regressions presented in Figure 2 of the main text. It emerges that the pattern of change across cohorts in the effects of parental class is substantially the same across models' specifications.

In Figure A5 we compare the results emerging from ordered logistic regressions (panel a) and from multinomial ones (panel b) for the effects of parental education. The dependent variable is track attendance coded in seven categories in panel a) and in four categories (the same used in the main text) in panel b). Also in this case we eliminated individuals not enrolled to upper secondary schools in the ordered specification, to better allow for a comparison with the results of the multinomial logistic regressions. It emerges that: a) the influence of parental education does not change over time, confirming the results

¹ We do not look at the interaction between parental social class and cohort, because we have several cells with very few cases.

presented in Table 2 of the main text; b) the pattern of the influence of parental education across cohorts is substantially the same across models' specifications.

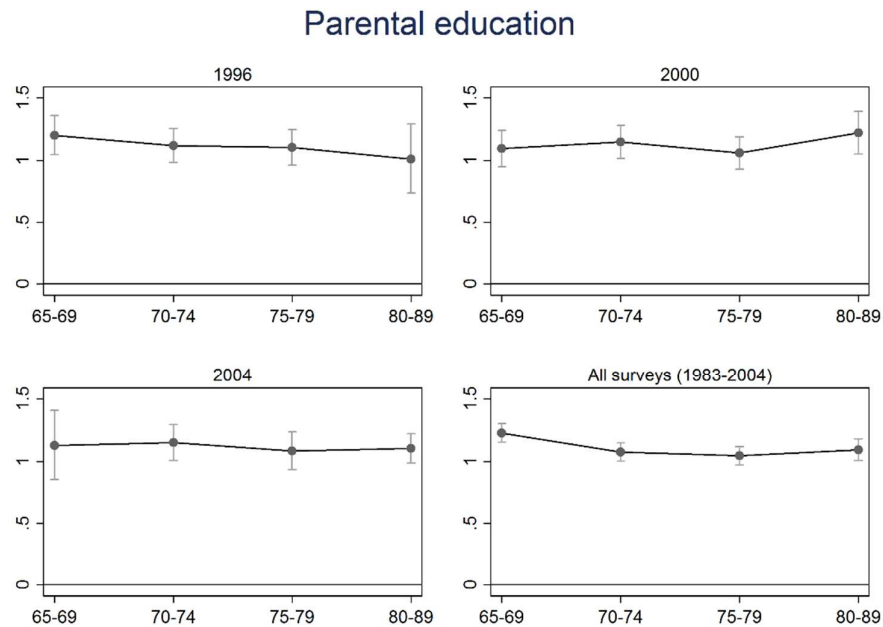


Fig. A2. Log-odds ratios and corresponding standard errors at 90% deriving from an ordered logistic regression to analyze the effects of parental education on track attendance over birth cohorts.

Note: The parameters represent the main effects of parental education plus the interaction coefficients between parental education and birth cohort.

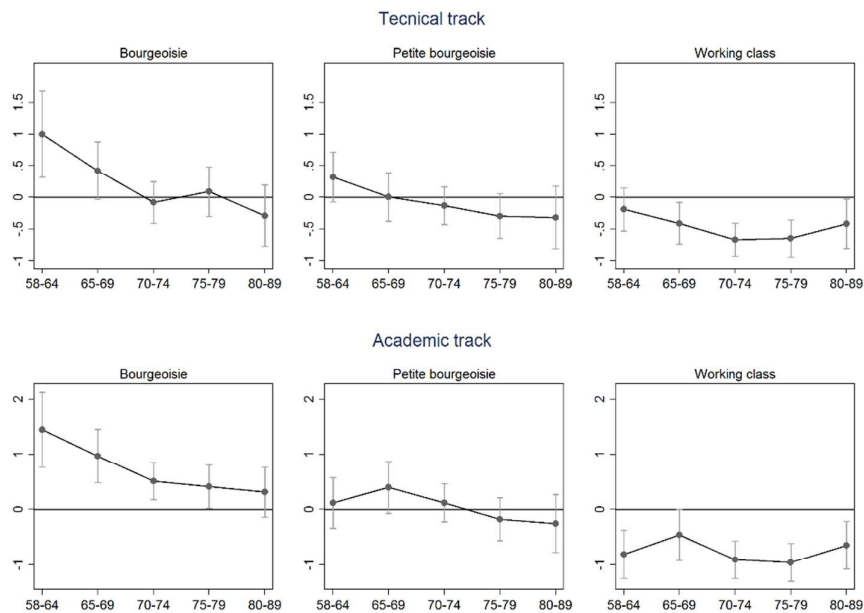


Fig. A3. Log-odds ratios and corresponding standard errors at 90% deriving from a multinomial logistic regression to analyze the effects of parental social class on the choice of the academic and technical tracks, with respect to the vocational one, over birth cohorts. The sample is restricted to individuals who are not studying at the moment of the interview.

Note: the reference category for parental social class is “White collars”. The parameters represent the main effects of parental social class plus the interaction coefficients between parental social class and birth cohort.

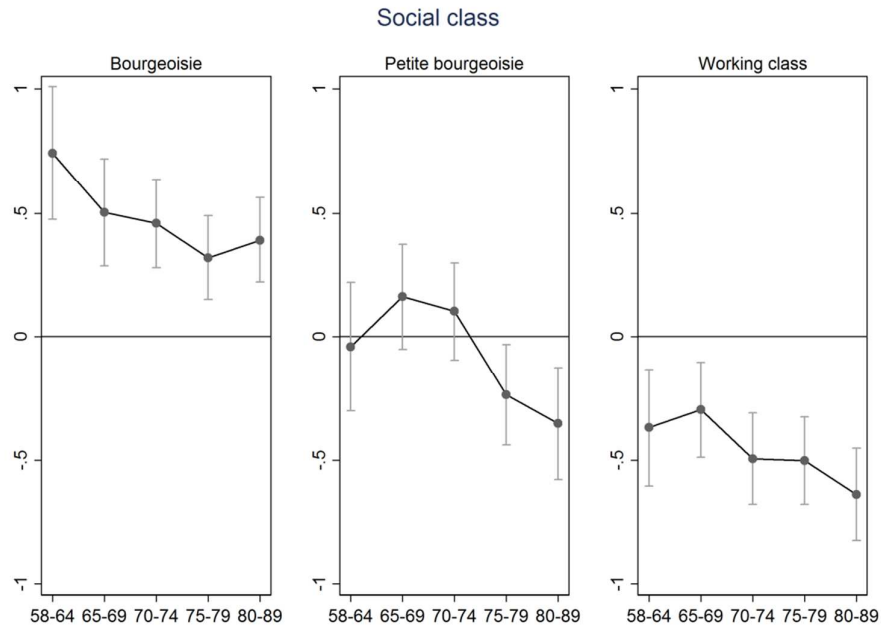


Fig. A4. Log-odds ratios and corresponding standard errors at 90% deriving from an ordered logistic regression to analyze the effects of parental class on track attendance over birth cohorts.

Note: the reference category for parental social class is “White collars”. The parameters represent the main effects of parental social class plus the interaction coefficients between parental social class and birth cohort.

a) Ordered logistic regression

b) Multinomial logistic regression

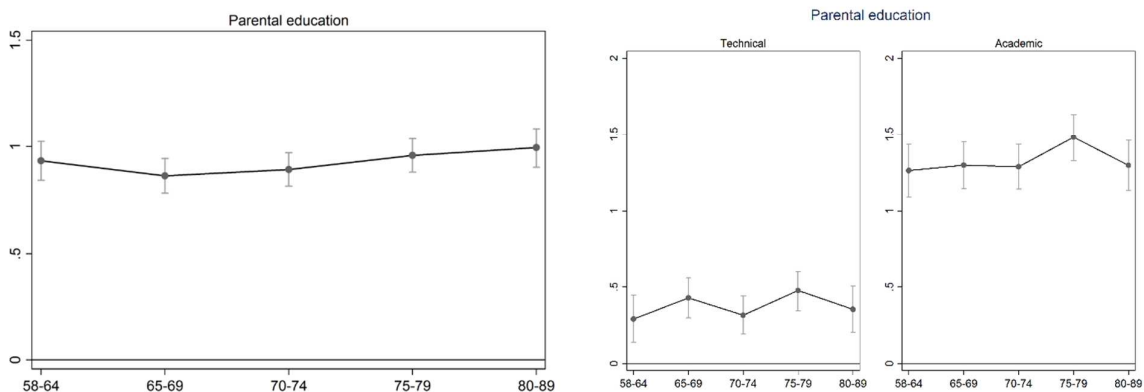


Fig. A5. Log-odds ratios and corresponding standard errors at 90% deriving from an ordered logistic regression (panel a) and a multinomial logistic regression (panel b) to analyze the effects of parental education on track attendance over birth cohorts.

Note: the parameters represent the main effects of parental education plus the interaction coefficients between parental education and birth cohort.